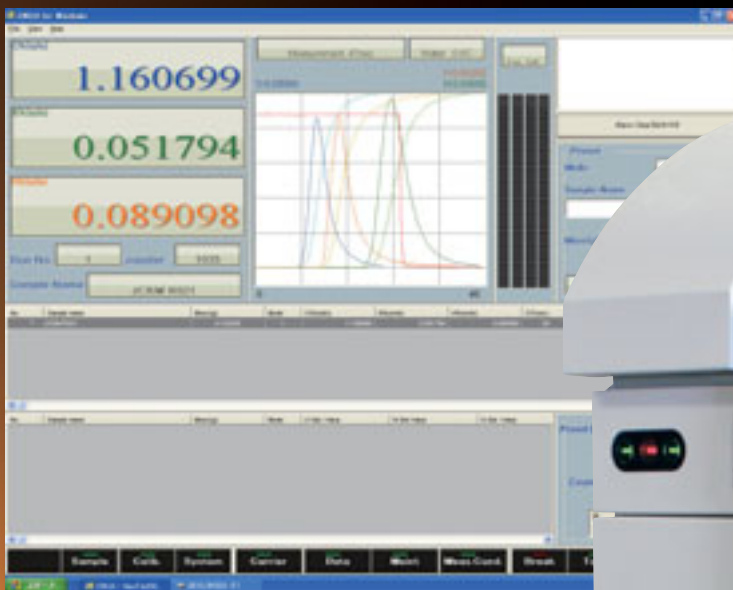


## Oxygen/Nitrogen/Hydrogen Analyzer

# EMGA-930

EMGA-930



*Oxygen*  
*Nitrogen*  
*Hydrogen*



# Evolution

## In Pursuit of High performance/Speed/Operability

EMGA-930 is a simultaneous oxygen/nitrogen/hydrogen elemental analyzer with high accuracy and repeatability suited to advanced R&D as well as quality control in the markets of steel, new materials, catalysts and many others. This is a new generation model optimized to fit the user's needs.



### Super High Performance

#### ● Wide measurement range

**Oxygen: ~5%(m/m) & Nitrogen: ~3%(m/m)**  
**Hydrogen: ~0.25%(m/m)**

- Dual detectors for CO and CO<sub>2</sub> provide the widest measurement range for oxygen.
- Optimized TCD design for nitrogen.
- Mounting NDIR, H<sub>2</sub>O detector that measures hydrogen enables to analyze 3 elements simultaneously.

#### ● Precision

- Oxygen/Nitrogen:  $SD \leq 0.02 \mu\text{g/g}$  or  $RSD \leq 0.5\%$  whichever is larger (Reference gas)  
 $SD \leq 0.3 \mu\text{g/g}$  (Standard sample value  $10 \mu\text{g/g}$  or less)  
 $RSD \leq 1.0\%$  (Standard sample value 0.01% to 0.02%)
- Hydrogen:  $SD \leq 0.04 \mu\text{g/g}$  or  $RSD \leq 2.0\%$  whichever is larger (Reference gas)

#### ● Standard method

- EMGA-930 fulfills requirements of the standard methods for analysis of steel, titanium, tantalum, ceramics etc.  
ISO 10720:1997, ISO17053:2005  
JIS G1228:1997  
ASTM E1019:2003, ASTM E1569:2003, ASTM E1409:2005 etc.

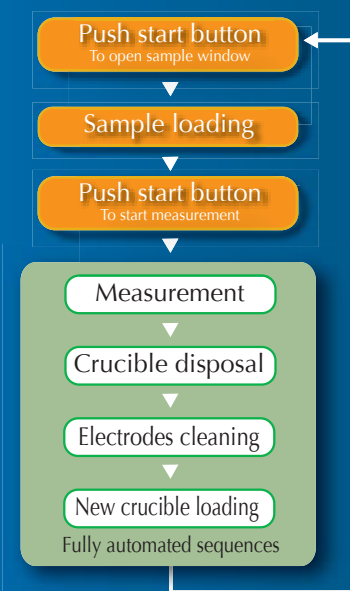
Analysis examples of JSS samples containing low concentration of Oxygen, Nitrogen and Hydrogen

	JSS GS-6b	JSS366-8	JSS GS-1d
	O ( $3.4 \mu\text{g/g}$ )	N ( $7.5 \mu\text{g/g}$ )	H ( $1.6 \mu\text{g/g}$ )
1	3.42	7.72	1.59
2	3.28	7.74	1.60
3	3.48	7.51	1.61
4	3.25	7.69	1.55
5	3.51	7.25	1.62
Average value	3.39	7.58	1.60
Standard deviation	0.11	0.20	0.02

### Simple Operation

#### ● Simple operation

EMGA-930 uses two automation systems for loading and disposing crucibles and for cleaning the electrodes after measurement. Automation sequences allow operation by simply positioning the sample and pushing the start button. The operator has to specify the method and the sample's name in the software. The crucible loader and auto cleaner avoid operator contact with carbon dust by providing clean operating conditions.



### User-friendly Software

#### ● Measurement window

Simple software allows easy operation. Extracted gas signals are displayed in real time numerically as well as graphically with curves that include temperature level. Graphs are saved automatically. In the measurement window, sample weight can be registered automatically. Results are saved in a data table for easy management.



#### ● HORIBA originality - Maintenance navigator

Maintenance counter informs users about consumables replacement to assure high accuracy results. In the same window, you can reach pictures and videos illustrating maintenance operations by a simple click. Operators can freely have a look at the concerned area by playing with the 3D display. As the navigator describes the easy-to-understand procedure for replacing parts, operators can perform routine maintenance without any experience or technical knowledge.



## Fully Supported Accessories

To achieve high-speed and simple operation all accessories are included in the EMGA-930.

### Crucible loader (Automated crucible supply system)



Precise capture and positioning of crucibles by rotary mechanism  
Maximum stock: 100pcs. Compatible with normal or long type crucibles.

### Hopper (Sample window)



Improved Hopper mechanism for easy cleaning.

### Auto cleaner



Two rotating brushes clean the upper and lower electrode after each measurement. The vacuum cleaner prevents contamination by removing dust.

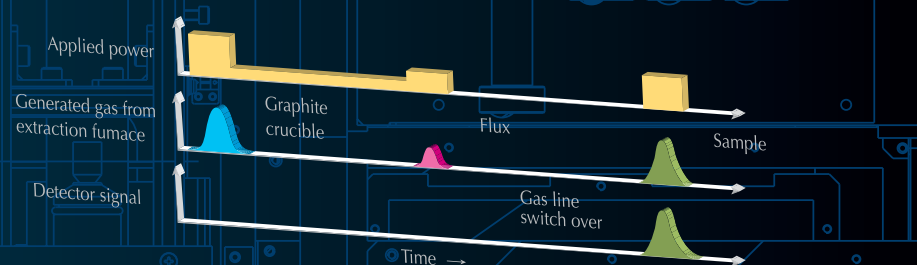
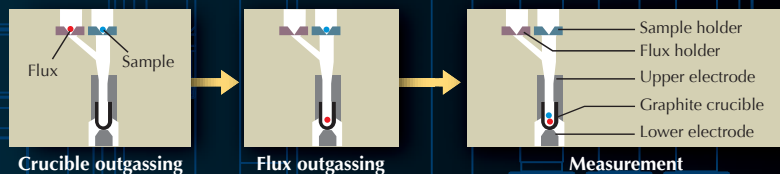
### Crucible waste box



About 200 crucibles can be held in the waste box.

### Sample/Flux dual loading mechanism

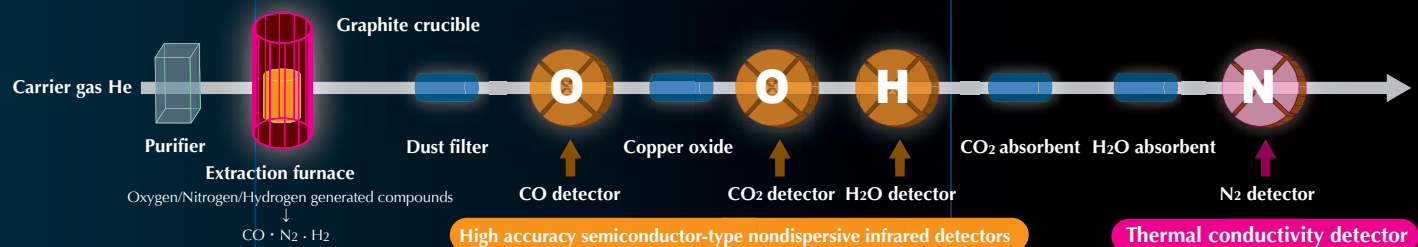
Thanks to this mechanism, sample and flux drop independently allowing outgassing of the flux at low temperature prior to the analysis. The benefits are prevention of flux spatter, control of crucible erosion and optimization of flux outgassing temperature. As a result, optimization of flux efficiency and blank reduction contribute to high accuracy measurements.



### Easy replacement of electrode and reagent tubes



### Gas flow diagram



- **Oxygen determination :** 2 NDIR detectors for high accuracy among the full measurement range. Automatically controlled by the software.
  - CO for high oxygen levels
  - CO<sub>2</sub> for low concentration of oxygen with high sensitivity
- **Hydrogen determination :** H<sub>2</sub>O with NDIR (Non Dispersive Infra Red analyzer)
- **Nitrogen determination :** N<sub>2</sub> with Thermal Conductivity Detector (TCD)

## Specifications

Product name	Oxygen/Nitrogen/Hydrogen analyzer
Model	EMGA-930
Principle	Oxygen: Non Dispersive Infrared detector (NDIR) Nitrogen: Thermal Conductivity detector (TCD) Hydrogen: Non Dispersive Infrared detector (NDIR)
Measurement range*	Oxygen: ~5% (m/m) Nitrogen: ~3% (m/m) Hydrogen: ~0.25% (m/m) *Up to 100% wt is possible by decreasing the sample weight.
Sample weight	1g as standard condition, possible to decrease
Sensitivity (Minimum reading)	Oxygen/Nitrogen/Hydrogen: 0.001µg/g
Precision (Repeatability)	Oxygen/Nitrogen: SD≤0.02µg/g or RSD≤0.5% whichever is larger (Reference gas) SD≤0.3µg/g (Standard sample value 10µg/g or less) RSD≤1.0% (Standard sample value 0.01% to 0.02%) Hydrogen: SD≤0.04µg/g or RSD≤2.0% whichever is larger (Reference gas)
Display	1) Measurement result: PC or printout 2) Alarm message: PC or printout 3) Flow sheet: PC
Type and power of furnace	Impulse furnace with inert gas fusion with power variable from 0 to 8.0kw
Sample loading	Sample/flux dual loading mechanism
Automation functions	Auto cleaner, Crucible loader
Integration conditions	Preset integration times, integration time to reach the comparator level or both with the shortest time used.
Sample ID	Enter up to 20 characters
Calibration	1) One point or multi point calibration (Reference gas or standard samples) 2) Calibration using previous analysis data 3) Calibration curve correction function

Functions	1) Display of realtime extraction curve 2) Analysis interruption 3) Self diagnosis and alarm display 4) Analysis of extraction curve 5) Output (RS-232C or TCP/IP)
Dimensions	653mm(W)×785mm(D)×750mm (H) Sample window is positioned at 650mm from table.
Weight	230kg: For transportation, the system can be split into 2 units < 140 kg each
Computer	PC with Windows® 7
Power	Main unit: AC200/220/230/240V ± 10% Vacuum cleaner: AC100V (Step-down transformer included) Frequency: 50/60Hz
Electric power consumption	Main unit: 12kVA (MAX) Vacuum cleaner: 1.5kVA (MAX)
Ground resistance	Less than 10Ω
Installation condition	Operation temperature: 5-40°C Optimum temperature: 5-35°C Humidity: Maximal relative humidity 80%RH between 5-31°C, Linearly decrease down to 50%RH between 31-40°C Vibration: Duplex amplitude 20micron and less than 0.098m/S <sup>2</sup> accelerations at frequency band
Required gas	He carrier gas: Purity greater than 99.995%, Pressure 0.35MPa Stainless steel tube(O.D.3mm) and suitable connector fitting within 3m from unit Dry air or N <sub>2</sub> as operating gas: Pressure 0.45MPa Nylon pipe(O.D.6mm) and suitable connector fitting within 5m from unit
Cooling mechanism	Separate Water Cooler unit
Electronic balance: option	Enable connection with electronic balance with 1-0.01mg sensitivity
Automatic voltage regulator (AVR): option	Capacity: 15kVA Weight: 130kg

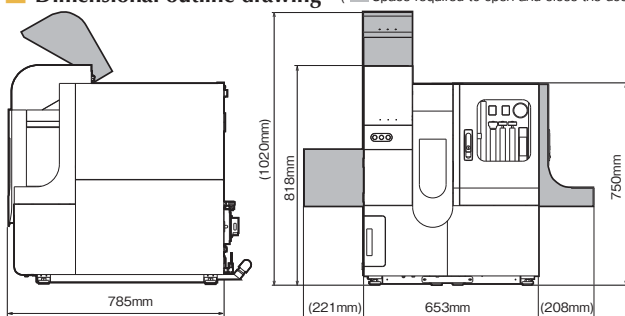
Windows is a registered trademark or trademark of Microsoft Corporation in the United States and other countries.

## Other available models

- EMGA-830AC: same performance as EMGA-930 but without crucible loader
- EMGA-830M: same performance as EMGA-930 but without crucible loader and auto cleaner

## Dimensional outline drawing

(Space required to open and close the door)

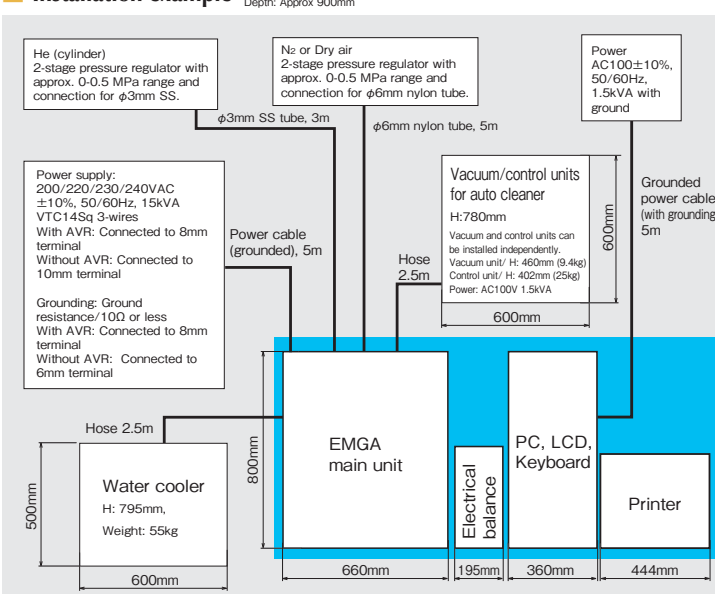


## Consumables/Options



## Installation example

Lab bench Minimum width: Approx 1800mm (Recommended 2000mm)  
Depth: Approx 900mm



Shown length of pipe and power cable are for accessories. Please install with enough space.



The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System OHSAS18001. We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.



Please read the operation manual before using this product to assure safe and proper handling of the product.

<http://www.horiba.com> e-mail: [info@horiba.co.jp](mailto:info@horiba.co.jp)

### ●HORIBA, Ltd.

Head Office  
2 Miyanohigashi, Kisshoin,  
Minami-ku, Kyoto, Japan  
Phone: 81 (75) 313-8123  
Fax: 81 (75) 321-5725

### ●HORIBA (China) Trading Co., Ltd.

Head Office  
Unit D, 1F, Building A, Synnex  
International Park, 1068  
West Tianshan Road,  
Shanghai, 200335, China  
Phone: 86 (21) 6289-6060  
Fax: 86 (21) 6289-5553

### ●HORIBA (Thailand) Ltd.

Head Office  
393, 395, 397, 399, 401,  
403 Latya Road,  
Somdetchaopraya, Klongsan,  
Bangkok, 10600, Thailand  
Phone: 66 (2) 861-5995  
Fax: 66 (2) 861-5200

Guangzhou Branch  
Room 1611 / 1612, Goldlion  
Digital Network Center,  
138 Tiyu Road East,  
Guangzhou, 510620, China  
Phone: 86 (20) 3878-1883  
Fax: 86 (20) 3878-1810

### ●HORIBA Instruments (Singapore) Pte Ltd.

3 Changi Business Park Vista  
#01-01 Akzonobel House,  
Singapore 486051  
Phone: 65 (6) 745-8300  
Fax: 65 (6) 745-8155

### ●HORIBA Vietnam Co., Ltd.

Unit 10, 4 Floor, CMC tower,  
Duy Tan Street, Dich Vong  
Hau Ward, Cau Giay District,  
Hanoi, Vietnam  
Phone: 84 (4) 3795-8552  
Fax: 84 (4) 3795-8553

### ●HORIBA Korea Ltd.

Seoul Branch  
10, Dogok-Ro, 6-Gil,  
Gangnam-Gu, Seoul-Si,  
06259, Korea  
Phone: 82 (2) 753-7911  
Fax: 82 (2) 756-4972

### ●HORIBA India Private Limited

Head Office  
246, Okhla Industrial Estate,  
Phase 3 New Delhi-110020,  
India  
Phone: 91 (11) 4646-5001  
Fax: 91 (11) 4646-5010

### ●Bangalore Office

Kamadhenu, No.17 / 1-32,  
Bannerghatta Road,  
Audugodi,  
Bangalore-560030, India  
Phone: 91 (80) 22210071

### ●HORIBA Instruments Brasil, Ltda.

Rua: Presbitero Plinio Alves  
de Souza, 645, Loteamento  
Polo Multivias Barro  
Medeiros-Jundiá Sao Paulo  
CEP 13.212-181 Brazil  
Phone: 55 (11) 2923-5400  
Fax: 55 (11) 2923-5490

### ●HORIBA Jobin Yvon SAS

16-18 rue du Canal,  
91165, Longjumeau Cedex,  
France  
Phone: 33 (1) 64-54-13-00  
Fax: 33 (1) 69-09-07-21

### ●HORIBA Jobin Yvon GmbH

Hauptstr. 1\* D-82008  
Unterhaching, Germany  
Phone: 49 (89) 46-23-17-0  
Fax: 49 (89) 46-23-17-99

### ●HORIBA ITALIA Srl

Via Luca Gaurico 209-00143,  
Roma, Italy  
Phone: 39 (6) 51-59-22-1  
Fax: 39 (6) 51-96-43-34

### ●PT HORIBA Indonesia

Jl. Jalur Sutra Blok 20A,  
No.16-17, Kel. Kunciran, Kec.  
Pinang Tangerang-15144,  
Indonesia  
Phone: 62 (21) 3044-8525  
Fax: 62 (21) 3044-8521

### ●HORIBA Instruments Inc.

Head Office  
9755 Research Drive, Irvine,  
CA 92618, U.S.A.  
Phone: 1 (949) 250-4811  
Fax: 1 (949) 250-0924

### ●Edison Office

3880 Park Avenue, Edison,  
NJ 08820, U.S.A.  
Phone: 1 (732) 494-8660  
Fax: 1 (732) 549-5125

Bulletin:HRE-3749B

Printed in Japan 1512SK13